

CLAIMS

Sub
21

1. A method of operation for a vehicle braking system including a driver activated brake pedal, a brake pressure modulator, and an anti-lock brake control that activates the brake pressure modulator to modulate vehicle braking upon detection of an insipient wheel lock condition, the method
- 5 comprising the steps of:

periodically measuring vehicle deceleration and a brake pedal position during activation of the braking system when said insipient wheel lock condition is not detected;

- 10 identifying conditions of degraded braking effectiveness based on the periodically measured deceleration and brake pedal position; and

adaptively adjusting a brake pressure control parameter of said anti-lock brake control when a condition of degraded braking effectiveness is identified so as to compensate for the identified condition.

2. The method of Claim 1, wherein the anti-lock brake control releases and then re-applies brake pressure at a determined apply rate upon detection of an insipient wheel lock condition, and the step of adaptively adjusting a brake control parameter includes adjusting the determined apply rate in a manner to provide an increased rate of brake pressure application.
- 5

3. The method of Claim 1, wherein the identified condition of degraded braking effectiveness is brake wear, and the determined apply rate is increased by a predefined factor.

4. The method of Claim 1, wherein the anti-lock brake control releases and then re-applies brake pressure at a determined apply rate upon detection of an insipient wheel lock condition, the method including the steps of:

- 5 estimating a road surface coefficient of friction based on the
periodically measured deceleration and brake pedal position;
 determining said apply rate based on the estimated road
coefficient of friction when conditions of degraded braking effectiveness are
not identified; and
- 10 determining said apply rate based on the estimated road
coefficient of friction and a measure of braking effectiveness degradation
when the condition of degraded braking effectiveness is identified.

5. The method of Claim 4, wherein the step of determining the
apply rate when the condition of degraded braking effectiveness is identified
includes the steps of:

- compensating the estimated road surface coefficient of friction for
5 error due to the identified condition of degraded braking effectiveness; and
 determining the apply rate based on the compensated estimate of
road surface coefficient of friction and the measure of braking effectiveness
degradation.

6. The method of Claim 4, wherein the identified condition of
degraded braking effectiveness is brake fading, and the measure of braking
effectiveness degradation is determined according to an amount by which an
estimate of brake temperature exceeds a nominal brake temperature.

7. The method of Claim 4, wherein the identified condition of
degraded braking effectiveness is fluid leakage, and the measure of braking
effectiveness degradation is determined according to an estimated rate of the
fluid leakage.

8. The method of Claim 4, wherein the braking system includes
an adjustable brake, the identified condition of degraded braking

effectiveness is mis-adjustment of said adjustable brake, and the measure of
braking effectiveness degradation is determined according to a difference in
5 wheel speeds attributable to such mis-adjustment.

9. The method of Claim 4, wherein the identified condition of
degraded braking effectiveness is excessive vehicle weight, and the measure
of braking effectiveness degradation is determined according to an amount
by which an estimate of vehicle weight exceeds a reference weight.

Patent Office